ROYAL ASTRONOMICAL SOCIETY.

VOL. XIII. *Supplemental Notice.* No. 9.

Note on the small Star near α Canis Minoris, and on the suspected variable Star β Corvi. By the Rev. T. W. Webb.

"Mr. Fletcher's very interesting remarks on the companion of *α Canis Minoris* having induced me to refer to some former observations of my own, I find that I saw it on February 28, 1848, with a power of 80, in my $5\frac{1}{2}$-feet achromatic. As Mr. Fletcher states that Mr. Bond announced its disappearance *in the same year*, this circumstance would seem to indicate a rapid variation o brightness, especially when the great disparity of the instruments is taken into consideration, my achromatic having an aperture of only 3·7 inches. At the time I saw it, it was probably not much fainter than the 8 or 9 magnitude, as I have not noted any discrepancy in that respect from the Bedford Catalogue, which I should have done, had there been any very striking diminution.

"I have observed the comparative brightness of the stars in *Corvus*, referred to in page 186 of the *Monthly Notices* for the present year, on one occasion only during the late spring. May 23, 1853, a little after 9^h, in twilight so strong that *Spica* alone, in all that region, was visible to my near-sighted eye, and with a concave eye-glass the principal stars in *Corvus* could hardly be well seen, unless brought near the centre of the field of view, I made an independent estimate of their magnitude without being able to recollect their alphabetical designation. A subsequent reference to the map showed that I had arranged them thus:—

$$\gamma\ \beta\ \delta\ \alpha,$$

with some doubt whether α might not have rivalled δ, at an equal elevation. It will be seen that this estimate differs from that of the spring of 1852, in which I gave δ the preference to β. But they both agree in giving the priority to γ, and increasing the suspicion that β has diminished since 1831. The latter observation may probably be entitled to most confidence, as, for obvious reasons, slight differences in brightness are most apparent near the limit of visibility;—a fact which, by the way, may give an advantage to the smaller class of telescopes, in examining the comparative light of stars between the 10, and 12, or 13 magnitudes."

"*Tretire, Herefordshire, June* 22, 1853."

The name of *Proserpine* has been given, at the suggestion of M. Humboldt, to the planet discovered by M. Luther on the 5th of May last.

Observations of Comet II., 1853 (Schweizer's). By Lieut. Goodenough, R.N.

(*Extract of a Letter to the Rev. Robert Main.*)

"I regret very much having sent you last month the observations of a comet seen here on April 30, as I immediately afterwards discovered, that from want of caution I had set down and worked out the degree of the distance from *Castor* as 58° instead of 63°, which was the correct. It is not possible to hold myself excused for so stupid an error. Allow me, however, to send to you the following set of sights, observed with one of Troughton's sextants, and most of them under favourable circumstances, the atmosphere of this place being generally peculiarly clear and free from haze.

April 30.

	h m s / ° ′ ″
Greenwich M.T.	11 9 37
True dist. from Castor	63 28 2
— — — Sirius.....	34 43 49

which give,

R.A. h m s 4 16 10	Decl. ° ′ ″ 12 15 7 S

May 1.

	h m s / ° ′ ″
Greenwich M.T.	11 32 2
True dist. from Rigel	5 12 30

No other observation could be obtained on account of clouds.

May 2.

	h m s / ° ′ ″
Greenwich M.T.	12 9 43
True dist. from Sirius	14 31 11
— — — Canopus...	39 27 26

which give,

R.A. h m s 5 39 19	Decl. ° ′ ″ 14 2 0 S

May 3.

	h m s / ° ′ ″
Greenwich M.T.	10 50 26
True dist. from Regulus ...	65 24 50
— — — Bellatrix ..	22 57 37

R.A. h m s 5 59 41	Decl. ° ′ ″ 14 11 30 S

May 4.

	h m s / ° ′ ″
Greenwich M.T.	10 37 30
True dist. from Regulus ...	61 56 24
— — — Betelguese	22 41 10

R.A. h m s 6 14 57	Decl. ° ′ ″ 14 14 31 S

May 5.

	h m s / ° ′ ″
Greenwich M.T.	10 48 11
True dist. from Regulus ...	59 20 37
— — — Betelguese	23 44 54

R.A. h m s 6 26 57	Decl. ° ′ ″ 14 13 54 S

May 6.

	h m s / ° ′ ″
Greenwich M.T.	10 47 55
True dist. from Regulus ...	57 23 14
— — — Pollux	44 59 20

R.A. h m s 6 35 42	Decl. ° ′ ″ 14 9 16 S

May 7. Obscured by cloud.

May 8.

	h m s / ° ′ ″
Greenwich M.T.	11 0 19
True dist. from Procyon...	22 23 7
— — — η Argus ...	61 39 41

R.A. h m s 6 48 14	Decl. ° ′ ″ 14 2 6 S

May 9.

	h m s / ° ′ ″
Greenwich M.T.	10 44 59
True dist. from Procyon ...	21 48 40
— — — Betelguese	26 51 17

R.A. h m s 6 52 49	Decl. ° ′ ″ 13 58 55 S

May 10 *and* 11. Too cloudy.

May 12.

	h m s / ° ′ ″
Greenwich M.T.	10 35 0
True dist. from Procyon ...	20 41 17
— — — Betelguese	28 11 22

R.A. h m s 7 3 30	Decl. ° ′ ″ 13 30 21 S

"On April 30, when first seen, the tail was about 4° in length, the nucleus very distinct from the coma, of the brightness of a star between 3d and 4th mag. On May 2 the *distinct* part of the tail had diminished to 1° 30′ in length, the brightness of the nucleus having diminished to that of a star of the 6th mag. It afterwards kept diminishing, and was last seen on the 17th, only by the aid of a good 2-foot telescope, of about 20 magnifying power, in a perfectly clear sky. Between the 12th and 17th the nights were cloudy.

"The distances have all been carefully corrected for refraction.

"Our position is, lat. 34° 32′ 30″ S; long. 58° 18′ 0″ W.

"*H.M.S. Centaur, Buenos Ayres,*
May 21, 1853."

(*Extract of a Letter from A. H. Gardner, Esq., Commander of H.M. Sloop Waterwitch, to Rear-Admiral Sir Francis Beaufort.*)

"When approaching Loando in her Majesty's sloop, under my command, on the 30th April, a comet was seen clearly by the naked eye, continued visible during the passage over to St. Helena, and was last seen near that island on the 14th inst. It was also seen, but not accurately observed, at St. Helena, as well as on board several merchant vessels. As no notice of its approach is given in the *Nautical Almanac*, and as it could not be seen in our country, I have thought an account of it might be interesting to you. The inclosed paper is by Mr. Vine, master's assistant, who first perceived the comet.

"*H.M. Sloop Waterwitch, Ascension, May* 31, 1853."

Observations of Comet II. 1853. By Mr. W. W. Vine.

"On April 30, 1853, about 7 p.m., I observed a comet bearing W. by S. (true), about 10° above the horizon. Its distance from *Sirius*, 37° 41′ 15″; from *Aldebaran*, 28° 38′ 0″. Its tail was 3° 15′ long, and pointed in the direction of *Canopus*. Our latitude at the time of observation was 8° 40′ S.; longitude, 12° 38′ E.

"On May 1st, comet visible, but not so bright as on the previous night, but its altitude about 13° higher. Distance from *Sirius*, 24° 45′ 20″; *Canopus*, 39° 50′ 30″; tail 3° long, and pointing in the same direction as before at St. Paul's de Loando.

"On May 2d, comet much decreased in size and brightness. Distance from *Sirius*, 16° 14′ 50″; *Canopus*, 39° 50′ 30″. Latitude, 8° 40′ S.; longitude 13° 0′ E. at time of observation.

"On May 3d, distance from *Sirius*, 10° 33′ 50″; *Canopus*, 38° 24′ 30″. Visible to the naked eye. Latitude, 8° 35′ S.; longitude, 12° 40′ E.

"On May 4th, comet in the constellation of *Canis Majoris*. I saw a star of (about) the sixth magnitude through its tail distinctly. Distance from *Sirius*, 6° 38′ 30″; *Canopus*, 38° 24′ 30″. Latitude, 8° 30′ S.; longitude, 12° 0′ E.

"On May 5th, distance from *Sirius*, 3° 59′ 0″; from *β Canis Majoris*, 4° 21′ 30″. Latitude, 8° 35′ S.; longitude, 10° 30′ E.

"On May 6th, distance from *Sirius*, 2° 31′ 30″; from *β Canis Majoris*, 5° 46′ 20″. Very indistinctly seen. Latitude, 8° 20′ S.; longitude, 8° 35′ E.

"On May 7th, comet not bright enough to get its position with a sextant. It continued visible until the 15th, when we lost sight of it. We were then in latitude 13° 25′ S.; longitude, 3° 30′ W. I determined its position by right ascension and declination for fifteen nights, the time it remained visible, taking my observations at 7 P.M. (ship time). Its path through the heavens was E. ¼ S. (nearly).

Observed Right Ascension and Declination of the Comet from April 30th to May 7th, at 7 P.M. (ship time).

Date.	R.A.	Change of R.A. in 24 hours.	Decl. S.	Change of Decl. in 24 hours.
	h m s	m s	° ′ ″	° ′ ″
April 30	4 4 3	+52 29	11 50 28	+1 35 32
May 1	4 56 32	35 16	13 26 0	0 33 30
2	5 31 48	23 36	13 59 30	0 14 0
3	5 55 24	16 16	14 13 30	0 1 45
4	6 11 40	12 50	14 15 15	0 0 45
5	6 24 30	8 30	14 16 0	+0 0 30
6	6 33 0	7 0	14 16 30	No change.

Mr. Vine's observations extend to the 14th of May. They do not, however, indicate any sensible change in declination after the 6th of that month.

Observations of Comet II., 1853. By Thomas Maclear, Esq.

"After some days of clouded weather, a comet was detected with the naked eye, in right ascension $4^h\ 58^m$, north polar distance 103° 25′, on the evening of Sunday the 1st instant. The nucleus about equal in brilliancy to a star of the 4th mag. The tail about 4° in length, inclined 118° from the north, reckoned as in measuring double stars, and one-sided with respect to the nucleus.

"The nucleus fan-shaped under a high power.

"The sky was covered on the 2d. On the 3d, the right ascension was $5^h\ 59^m$, north polar distance 104° 11′; and on the 4th, $6^h\ 13^m$, and 104° 15′ respectively.

"The nucleus was still pretty bright on the 9th, though nigh invisible to the naked eye. Last night all trace of the tail had vanished, the right ascension $7^h\ 16^m\frac{1}{2}$, north polar distance 103° 12′.

"The weather has permitted seventeen observing nights out of twenty-three. The comparisons with stars near the path have been made with the spider-line micrometer attached to the $8\frac{1}{2}$-foot

equatoreal; and the number of stars compared amount to 24. The details will be forwarded by the next mail.*

"There is a notice in the *Astronomische Nachrichten*, No. 853, received yesterday, of a comet detected by Professor Secchi, on the 6th of March, supposed to have passed its perihelion on the 24th of February, and to have been a conspicuous object in this hemisphere. I am not aware of any but the one above reported.

"*Royal Observatory, Cape of Good Hope,*
May 24, 1853."

The following notes and observations of Comet II., 1853, have been communicated by Capt. Charles F. A. Shadwell, R.N., who obtained possession of the materials of them during his recent passage from India to this country in the Royal Mail Steamer, Lady Jocelyn. These observations were made on the occasion of the outward passage of the Lady Jocelyn to India. The computations which assign the comet's position in right ascension and declination are due to Capt. Shadwell.

Notes on the Comet of May 1853, observed on board the Royal Mail Steamer, Lady Jocelyn. By Mr. S. H. Wright, Second Officer.

1853, April 30. The comet was first seen on April 30, soon after sunset, at $6^h\ 45^m$ p.m., the Lady Jocelyn being then on her passage from the Cape to Mauritius, and was thus described.

The nucleus of the comet was as large as a star of the 1st magnitude, and of a pale blue colour. The tail pointed towards *Rigel*, was about 6° in length, distended at the outer end about 20′, and of a streaky appearance.

May 1, 7 p.m. The nucleus of the comet was less in size by about one magnitude than when seen yesterday. The tail had the same appearance, but was considerably diminished in point of size, not being more than 3° in length.

May 2, $7^h\ 15^m$ p.m. The comet has again decreased in size, the tail being only 1° 30′ in length. The nucleus not larger than a star of the 3d magnitude, and very faint.

Owing to cloudy weather the comet was not seen on May 3d and 4th.

May 5, $7^h\ 45^m$ p.m. Comet again visible. Tail partly surrounding the nucleus, being 10′ to the westward and 45′ towards the eastward. The streaky appearance has left it, and it is now of a pale light.

May 6, 8 p.m. Comet getting very faint. When viewed

* The paper containing the observations here referred to has been received at the Apartments of the Society. The results will be published in the *Monthly Notice* for November.

through a telescope the nebulous part seemed completely to surround the nucleus in the form of an oval. The greatest diameter from E.S.E. to W.N.W. about 1° in length. The lesser diameter about 30′.

May 7. Comet growing fainter. Distance to comparison stars measured with difficulty.

For several days subsequent to the last observation the comet could be seen through a telescope, gradually diminishing in size, but retaining very nearly the same position in the heavens.

The following table gives the observations made between April 30th and May 7th, with stars lying near the comet's path, and the computed places resulting therefrom. The observations are uncorrected for refraction :*—

Date. 1853.	Position of Ship.	Approx. G.M.T.	Distance from Comparison Stars.		Computed R.A.	Computed Decl.
	° ′	h m		° ′	h m s	° ′
April 30	35 50 S	4 17	α Orionis ...	33 6	3 57 47	−11 28·5
	36 15 E		η Argûs	85 28		
May 1	35 13 S	4 18	Rigel	5 58	4 54 17	−13 23·5
	39 38 E		Sirius	25 23		
2	33 58 S	4 14	Rigel	8 4	5 31 14	−13 57·4
	44 26 E		Canopus ...	39 54		
5	28 25 S	4 5	β Can. Maj.	4 3	6 23 27	−14 12·7
	54 23 E		Sirius	4 20		
6	25 34 S	4 12	Canopus ...	38 44	6 29 45	−13 55·0
	56 16 E		Procyon	24 50		
7	22 32 S	4 9	β Can. Maj.	6 46	6 38 26	−13 41·3
	57 27 E		Sirius	2 50		

May 5. Assumed position of β Can. Maj., $6^h\ 16^m\ 22^s$, 17° 53′ 16″ S.
May 6 and 7. Comet growing faint; observations made with difficulty.

Capt. Shadwell has also communicated some physical observations of the same comet by M. Bosquet, the Government Meteorological Observer at the Mauritius. An account of these will be given in the *Notice* for November.

Comet III., 1853.

This comet, which was discovered by M. Klinkerfues at Göttingen, on the 10th of June last, became distinctly visible to the naked eye towards the end of August, agreeably to the prediction of M. Brühns (*Ast. Nach.* No. 869). It has even been observed in full daylight with the telescope, both by Mr. Hartnup and M. Julius Schmidt.

The following, which may be considered as the most recent

* Accompanying these observations was also a very neatly-executed chart, exhibiting the comet's path through the stars in its vicinity.

determination of the orbit of this comet is by M. D'Arrest (*Ast. Nach.* No. 875, p. 192):—

T ...	1853, Sept. 1·74969	M.T. Berlin.
π	310° 58′ 29″·8	Mean Equinox, 1853·0.
Ω	140 31 3·4	
i	61 30 46·2	
Log q	9·4867092	

Motion direct.

Discovery of a New Comet. By M. Brühns.

On the night of the 11th September, M. Brühns, of the Berlin Observatory, discovered in the constellation of the *Lynx* a pretty large nebulous object, having some resemblance to a cluster of stars, but which from its proper motion he soon recognised to be a comet.

1853.	M.T. Berlin. h m s	R.A. ° ′ ″	Decl. ° ′ ″
Sept. 11	13 12 15·3	126 59 11·5	+44 51 33·6
13	12 6 31·0	129 33 3·7	+43 47 17·4
15	12 13 53·8	132 22 8·9	+42 29 54·5

The following elements of this comet have been calculated by M. Brühns from the observations of Sept. 11, 16, and 21:—

Comet IV. 1853.

T	Oct. 16·6304	
π	301° 55′ 8″·8	Mean Equinox, 1853·0.
Ω	220 19 11·8	
i	61 15 55·2	
Log q	9·23106	

Motion retrograde.

Explanation of some Points relative to the Photometry of Telescopic Stars. By the Rev. W. R. Dawes.

In an Appendix to the twelfth volume of the Radcliffe Observations, recently published, is contained a series of highly interesting and valuable remarks and observations on the photometry of stars by means of the heliometer. In referring to a paper of mine, "On a Photometrical Method of Determining the Magnitudes of Telescopic Stars," which was printed in the *Monthly Notices* for June 1851, Mr. Johnson has suggested (see p. 16 of the Appendix), that in my observations, according to that method, I probably diminished not only the aperture of the telescope, but "also the pupil of my own eye to $\frac{3}{5}$ of its natural dimensions, and thus curtailed its capacity for receiving light:" and proceeding upon this

hypothesis, he shows, very ingeniously, that the discordance between his results and mine may be almost wholly removed. It may, therefore, be desirable that I should state, that my method has been in this respect misapprehended, and that *no diminution of the pupil* was employed in my telescopic determinations of magnitudes. The discordance of our results remains, therefore, to be accounted for.

It has also been supposed (see p. 17 of the Appendix), that the apertures employed by me in the determination of magnitudes, by reducing the light of the stars to a minimum, are not given in my paper above alluded to; and that they must have been different from those contained in the table on p. 191 of the *Monthly Notices*. The apertures there stated, however, are those which I actually employed, as being *suitable to my own eye*, which requires an aperture of $0^{in}\cdot15$ to render visible Argelander's average sixth magnitude. The minimum visibility of a star with any one of the apertures in that table *determines* it to be of the magnitude corresponding to that aperture, and standing against it in col. 1. The heading of that column ("Σ's magnitudes") does not indicate that the numerical magnitudes composing it were *actually assigned by Struve to any particular stars observed and estimated by him*, but only that those magnitudes are arranged according to the ratio of progression employed by Struve and adopted by myself; as those in col. 2 represent the *theoretical* scale adopted by Sir John Herschel. In fact, the magnitudes in col. 1 are carried down to the 15th, and in col. 2 to the 24th; whereas Struve never estimated magnitudes below the 12th, nor Herschel below the 20th.

Remarks on the Application of the Heliometer to the Photometry of the Stars. By Manuel J. Johnson, Esq., Director of the Radcliffe Observatory, Oxford. (Appendix I. to vol. xii. of the Radcliffe Observations).

Before proceeding to give an account of his researches on this subject, Mr. Johnson explains a mode of estimating the magnitudes of the stars, which was practised by himself and his assistant Mr. Lucas, while engaged in reobserving the objects of Groombridge's Catalogue with the meridian instruments. This was founded on the degree of illumination which was necessary for the observation of the star, if under the sixth magnitude, and in the case of larger stars, on the visibility of the *corona* or halo of light by which the object was observed to be surrounded. In this manner he was enabled to form an unbroken scale of brightness, extending from stars of the fourth down to those of the tenth magnitude, the latter being the smallest stars visible in the transit telescope when the field of view was slightly illuminated. A very satisfactory accordance was found by Mr. Johnson to subsist between his own results and those of his assistant; and after some experience of the method he felt convinced that a tolerably accurate judgment of the relative brightness of the stars might be formed by employing it.

Subsequently, the observations with the heliometer suggested to Mr. Johnson the possibility of obtaining a photometric definition of his scale. In measuring the distance between two stars of unequal magnitude, it becomes necessary to reduce the aperture of one of the segments of the divided object-glass. It therefore occurred to him, that by reducing the aperture of the segment through which the brighter star is seen, until both stars are made to appear of equal magnitude, the ratio of light would be inversely as that of the squares of the diameters of the apertures. He afterwards found that this method had been recommended by Bouguer in the middle of the last century, and that it had been subsequently applied by several observers, including among others the Rev. W. R. Dawes, with whose researches he became acquainted some time after he had been engaged in the inquiry.

The plan pursued was very simple. A number of semicircles of card-board or stiff paper were prepared, having the same exterior diameter as the object-glass, with concentric apertures diminishing by $\frac{1}{4}$ of an inch from seven inches to half an inch. These fitting into the frame of the object-glass, were kept in place by knee-springs.

The objects under comparison having been brought into the field, the segment through which the bright star was seen, was reduced until its light was equalised to that of the smaller one. In the course of observations of this kind, Mr. Johnson found it necessary to institute a series of delicate experiments with the view of determining whether the two half object-glasses possessed equal facilities of transmitting light, and whether this was true for every part of the same segment.

It remained to compare the photometric results obtained in this manner with the magnitudes estimated with the meridian instruments, and with the corresponding estimates of other observers. This comparison is exhibited in a series of tables which Mr. Johnson has appended as the results of his researches.

Table I. contains observations to determine the scale of magnitudes used in the Radcliffe observations. The stars compared together range from the fourth to the ninth magnitude, but generally there is a preponderance of small stars. The mean ratio of the diminution of light, corresponding to an interval of a whole magnitude, was found by him to be 0·424. The mean error of a single comparison was 0·057, and as there were sixty of such comparisons, the mean error of the final result was 0·007.

Table II. contains the results of some experiments to test the accuracy of the ratio 0·424, when applied to stars of a higher class than those from which the ratio was mainly deduced: it also exhibits a comparison between the photometric magnitudes due to this ratio, and the estimated magnitudes of other observers.

From certain experiments made by Sir John Herschel on the relative brightness of the larger stars, Mr. Johnson found that the ratio of the light of a star of the first magnitude to one of the sixth magnitude is as 112 : 1. This indicates a diminishing ratio of

0·407, a result which agrees very nearly with the ratio which Mr. Johnson had deduced from his own estimated magnitudes.

Mr. Johnson also found that for stars from the first to the sixth magnitude, the numbers assigned by the photometric ratio 0·424 his presented a striking agreement with those given by M. Struve in *Catalogus Novus*, p. xxxv., and *Mensur. Microm.* p. lxviii., which was deduced entirely from considerations founded on the relative number of stars of each class, and on their equal distribution throughout space.

"Argelander and Groombridge," says Mr. Johnson, "apparently guided by similar considerations, both arrived at nearly the same *ideal* standards as ourselves, as the following comparisons will show. Our object-glasses, it will be remembered, are four inches in diameter, and we note to (10); Argelander's is 4·25 inches, and he noted also to (10); Groombridge's object-glass was 3·5 inches, and he did not go lower than the (9) magnitude.

Radcliffe Obs.	Groombridge.	No. of Comps.	Mean Error of One Comp.	Argelander.	No. of Comps.	Mean Error of One Comp.
3·0	2·8	11	±0·30	2·6	11	±0·45
4·0	3·9	20	·29	3·9	20	·32
5·0	5·0	20	·35	5·1	20	·25
6·0	6·1	20	·32	6·1	20	·30
7·0	7·0	40	·38	7·2	63	·38
8·0	7·9	40	·41	8·2	54	·39
9·0	8·9	40	±0·40	9·2	40	±0·37

From twelve photometric comparisons, Mr. Johnson deduced the ratio of diminution of light corresponding to a whole magnitude in Groombridge's scale to be 0·388, with a mean error of ±0·029; and from twenty such comparisons he found the ratio of diminution in Argelander's scale to be 0·431, with a mean error of ±0·015.

It is a remarkable fact that Mr. Dawes, by adopting a ratio of diminution equal to 0·25, obtained a series of magnitudes which appeared to him to present a satisfactory agreement with the estimated magnitudes of Argelander, although the latter have been found to correspond very nearly with those of Mr. Johnson, which proceeds according to a different ratio from that assumed by Mr. Dawes. Mr. Johnson has suggested an explanation of this discordance, in which, however, it will be seen that Mr. Dawes does not concur.

Table III. contains some observations made for the purpose of determining Struve's scale in his *Mensuræ Micrometricæ*. From a series of comparisons between the estimated magnitudes of Struve and his own photometric results, Mr. Johnson deduced the mean ratio of diminution of light to be 0·348, the mean error of a single comparison being ±0·036, and that of the entire result ±0·007. This result, however, he found to be true only for stars above the 6·7 magnitude. For smaller stars, M. Struve appears to have adopted a ratio which Mr. Johnson found on the whole to present a satisfactory agreement with his own, viz. 0·424.

It would seem also that Sir John Herschel, in his observation of double stars, recorded in the *Memoirs* of the Astronomical Society, adopted a different scale for stars above and below the sixth magnitude. Assuming the ratio of diminution to be 0·480 for the former class of stars, and 0·357 for the latter, Mr. Johnson showed that the estimated magnitudes would be represented with tolerable accuracy. It is worthy of remark that in this case the transition is from a higher to a lower ratio, whereas the contrary appears to hold good in the case of Struve's observations.

"As a concluding remark to this part of my subject," says Mr. Johnson, "I will recall the reader's attention to the fact that, in the course of the discussion, the law of diminution has been deduced from *five* different authorities, and another result from Otto Struve is given at p. 45. All these observers acted quite independently of each other, and though their instruments varied from the $3\frac{1}{2}$ to the 15-inch refractor and 18-inch reflector, yet their determinations, notwithstanding many and great individual anomalies, present a general appearance of consistency and agreement which can hardly be accidental.

"The several results are as follows:—Sir John Herschel's being that which was deduced from the light of *Sirius;* Struve's, his mean ratio from (1) to (12), which is his own limit; if we had taken (13), his value would become ·415, and the agreement would be more perfect.

Herschel	0·407	Weight 1
Struve	0·383	2
Otto Struve	0·406	1
Argelander	0·431	3
Groombridge	0·388	1·5
Radcliffe Observatory.....	0·424	4

"Allowing the annexed weights to the respective results, the mean is 0·412, with a mean error of $\pm$0·0065; and I have reason to believe that with a very slight modification this law will be found to hold good from *Arcturus*, taking Sir John Herschel's estimate of that star on his vulgar scale, through the intermediate stages to the (9) magnitude on Argelander's or our own."

Table IV. contains observations for the purpose of determining the variation of light of *δ Cephei*.

Mr. Johnson's observations of this star were made in the months of August and September 1851. They indicate the period of variation to be $5^d\ 6^h\ 36^m\ 20^s{\cdot}4$. By combining his own observations with Argelander's minimum of 1840, Nov. 1·503, he found the period to be $5^d\ 6^h\ 42^m\ 18^s{\cdot}4$.

Mr. Johnson concludes the account of his labours by pointing out the class of objects to which the heliometer is more especially adapted as an instrument of photometrical research. "The costliness of the instrument," he remarks, "will probably suggest an argument against its use. But this need not be an impediment. A half

object-glass of 4 inches will penetrate to a (10), which is only one magnitude higher than half of 7·5 inches will reach; and the instrument itself would be very much more convenient. A very ordinary equatoreal mounting would suffice, and no great expense need be incurred in its other fittings. Indeed, I am not sure if it would not be better to return to Bouguer's original construction, and employ two entire object-glasses of smaller dimensions. This, I imagine, would be a still more economical arrangement."

"It is a subject which may be taken up at any time: it does not require continuous exertion; it involves no tedious calculations. For these reasons it is well suited to amateurs, to whom, if I mistake not, a rich and interesting field is open, which professional observers, from the extent of their avocations, will be unable to enter."

Report addressed by the Astronomer Royal for Scotland to the Board of Visitors, at their Visitation of the Royal Observatory, Edinburgh, November 1852.

It will be seen from this report that Professor Piazzi Smyth has finally completed the reduction and printing of his predecessor's observations, and that he has already made considerable progress in preparing for the press his own observations of the years 1849–50–51. The class of objects, which has recently occupied his attention, has been already alluded to in the last Annual Report of the Society.

Steps have been taken for forming a galvanic connexion between the Observatory and the Railway Station at the Waverley Bridge. As soon as this shall be effected, the Observatory will be enabled to maintain an unbroken galvanic communication with the Royal Observatory of Greenwich, a circumstance which cannot fail to be attended with important advantages.

Professor Smyth remarks that the bright twilight which prevails during the summer months in high northern latitudes, and the generally cloudy state of the atmosphere, have proved very unfavourable to accurate observation, during the period when his duties in connexion with the University allow him most leisure for the prosecution of his labours at the Observatory. He proposes, therefore, that an arrangement should be made, enabling the Director to proceed annually with an equatoreal to some elevated region in a southern latitude, where he might execute a series of measures at a *temporary* observing station during the summer months; which measures in the autumn would be brought home, computed, and printed with all the resources of a civilised country, the results forming part of the usual Observatory Volume. He points out the peculiar advantages which the Peak of Teneriffe affords for this purpose. "As to the instrument itself," he adds, "I have devised a new construction of the equatoreal stand, which will allow of its being taken to pieces, and transported with great facility."

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— — — 70, — — — — *for* R^2, *read* K^2.
— — — — — 27 — — *for* $\sqrt{\frac{1}{4}K^2-M^2}$, *read* $\sqrt{\frac{1}{4}K^4-M^2}$.
— — — 87, — 1 — — *for* 1852, *read* 1853.
— — — 93, — 29 — — *dele* Sir.
— — — 97, — 2 — — *for* Ross, *read* Roy.
— — — 126, — 36 — — *for* them, *read* three.
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— — — 186, — 5 — — *for Coronæ*, *read Corvi.*
— — — 226, 7, 8 1, *for* Mr. Robinson, *read* Dr. Robinson.

London :—Printed by G. Barclay, Castle St. Leicester Sq.

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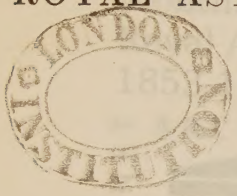

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